RESUMÉ OF EPIDEMIOLOGICAL INVESTIGATIONS OF EPIDEMICS OF POLIOMYELITIS WITH REFERENCE TO CONTAGIOUSNESS.*

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The present epidemic of acute anterior poliomyelitis in New York City with the possible danger of its spread to California makes it necessary that we consider the vitally important epidemiological data that has been gathered in the various outbreaks of this disease. We may preface this discussion by stating that to no one factor can the spread of the disease in a community be absolutely attributed. It is for this reason that the methods of prophylaxis and control are largely theoretical and indefinite. Nevertheless we are justified in using every means at our disposal for the protection of the public.

Contagiousness. Various investigators have proven conclusively that the disease is caused by a filterable virus, which is present in nasal and bucal secretions, and also in the intestinal contents. Quoting from Hill,[1] Minnesota, "If the infective agent escapes by way of the naso-pharynx any great actual infectiveness developed should parallel diphtheria, scarlet fever, or possible pneumonia, in its epidemiologic characteristics. If by the intestine, it should parallel more or less closely the infectiveness of typhoid fever. If poliomyelitis does not parallel any of these, it would seem uncalled-for to insist on its great contagiousness.

"Further studies must determine such points. I can personally vouch that poliomyelitis is not prevented from spread, at least so far as the cases here discussed furnish evidence, by care in controlling the discharges, for precautions so efficient as to prevent the spread of the disease from the patient to other members in the house through the discharges, were not taken as a rule."

Again Hill [1] states "that 292 families containing 1670 members, an average of 5.7 members per family, presented 292 initial cases. In 257 families no further case occurred, but in 35 families the initial case was followed by others, whether occurring on the same day or later." The secondary cases were as follows: 30 families, 1 additional, 4 families, 2 additional, and 1 family, 3 additional.

Francis,[2] reporting an epidemic in Texarkana and vicinity, states: "In one instance there were three cases in the same family. In three instances there were two, and in each of the other 139 families there was but one case."

Kelly, Gilhorn, and Manning,[3] reporting poliomyelitis in the State of Washington, state "that throughout the progress of the investigation special attention was directed to any instances of possible transmission." Out of 136 cases they report 120 families, 1 case, 8 families, 2 cases, and no families with more than 2 cases, and in only 23 cases were there any apparent transmission from person to person either by contact with an acute case, with a possible abortive case, or with contact by a third person.

In an epidemic reported in Kansas in 1909,[4] out of 58 families in which cases occurred only in 9 were there more than one case.

Dixon and Karsner [5] reported that in Pennsylvania in 773 cases only in 59 was there a distinct history of exposure to previous cases, and in only 44 out of 1076 cases did secondary cases develop in the household.

Gundrum,[6] reporting cases in California for 1910, 1911 and 1912, gives the percentage of contacts in adults as 1.3% and in children 7.2%.

Reporting poliomyelitis in Massachusetts in 1908,[7] out of 67 cases in which there was little or no attempt at isolation, there being 166 children in families affected, only four of these later acquired the disease. In addition there were 86 children among neighbors and friends, making a total of 252 children exposed. In 1909, out of 86 cases in 79 families only two cases occurred in seven of them.

Frost [8] reported that in Iowa in 1910 in 309 families in which cases occurred, these families containing 1900 members, there were 307 primary and 27 secondary cases. In Cincinnati in 1911 in 184 families, estimated to contain 920 members, there were 97 primary cases and one secondary. In Buffalo and Batavia, New York, in 1912, in families in which there were 1513 members, there were only 267 primary and 6 secondary cases.

Terriberry,[9] reporting an epidemic in Pennsylvania in 1907, stated that in 50 cases that occurred they were all in children and in every instance two or three cases appeared in the same family.

Shidler [10] reported in Nebraska in 1909 that in a threshing crew in which one of the members became ill with the disease 7 others contracted it.

The School as a Factor in Contagiousness. Frost,[8] in Mason City, Iowa, is quoted as follows: "If the disease is spread by contact in schools it was evidently very slightly contagious under the conditions existing in the schools. Assuming that one case in a school constitutes an exposure of all the children in that school, then in three schools in which cases occurred during the school term 1529 children were exposed to the infection, of whom only 7 (0.45%) subsequently developed the disease during or within two weeks subsequent to the school session. Considering only the children exposed to infection from a previous case in the same grade at school, 298 children were so exposed, of whom five later developed the disease. In Cincinnati 10 cases were distributed between nine different schools which 6053 pupils attended. There were no secondary cases. In Batavia, New York, in no instance were there two cases among the pupils of the same grade in a school. Of 26 cases 5 were attending school at the time of illness.

Langer [11] believes that schools are a source of infection and all possible measures should be taken to prevent the spread of the disease. He states that 60 cases occurred during the school year and 37 during vacation, but there were cases in children not attending school.

Wickman [12] states that in one town 16 or 18 cases originated from a single school house.

In the Monthly Bulletin of the Ohio State Board of Health,[13] in summing up the epidemics that have

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occurred in Ohio there was stated that no single school was found to be a focus of infection.

Table of Cases of Poliomyelitis in California for 1913, 1914, 1915.

Year.	Cases.	Deaths.	Case rate per 1000.	Fatality per 100.
1913.....	90	33	.033	36.67
1914.....	56	26	.020	46.43
1915.....	62	19	.022	30.65

CONCLUSIONS.

Judging from the data reported above it would seem that either the disease is only slightly contagious or that there are many persons with a natural immunity or who acquire immunity without showing symptoms of the disease.

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SIR VICTOR HORSLEY.

An Appreciation.

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Only a few weeks ago the scientific world was startled by a dispatch from the Far East telling of the death of Sir Victor Horsley.

During the early part of the war he had been in France. Later he was called to the base at Alexandria for the Gallipoli campaign. In a letter from there a year ago he mentioned a promotion to consulting surgeon, and in another letter from Bombay, received two weeks before his death, the distressing situation in Mesopotamia with its imperative need was vividly disclosed. Because this was the most demanding service, he generously responded to it regardless of the frightful conditions to which ultimately he succumbed.

How difficult it is to write calmly of such a sacrifice, even for the country he so dearly loved. The loss to science of such a mentality as Victor Horsley's is out of all proportion to any patriotic or humane demand of any country. His titanic genius belonged to the whole world and his constructive philanthropies were of all times most needed now.

Horsley's mind, in the clarity of its scientific vision, was of the mold of Darwin, Huxley and Tyndall. He surpassed his peers in that human warmth and fellowship which made him instant kin with all that suffered, however lowly their estate.

How often have we known of the generous instinct which thought it no hardship to go at any hour of the night to the most sinister haunts of squalor in Whitechapel or Soho to help some poor suffering creature. That was why he fell fighting for his fellowman in the glare of the killing heat along the Tigris. His dauntless spirit volunteered for the difficult and discouraging tasks before which weaker minds paled in fear.

It is unthinkable that the activities of this master mind are forever closed. For more than thirty years he was held by the profession to be easily the first authority on the surgery of the brain and cord. In truth it were no exaggeration to say he created brain surgery and made of it an organized scientific entity.

We cannot here recount the long succession of brilliant researches which singularly distinguished his career. He was made a fellow of the Royal Society at twenty-three. From that time on with a rapid sequence, unexampled in our guild, his honors came in crowding numbers. During his life and at his death his own countrymen rated him as England's first, most versatile and accomplished surgeon. Kocher, who of the Continental men knew him most intimately, so classed him in enthusiastic compliment. But in those whose rare privilege it was to know him as a personal friend, there developed a bond of affection akin to worship. He was so altogether lovable in his companionship, so incomparable in his hospitalities, so charming in sport.

Amongst the many tributes to Sir Victor's memory none has seemed to me quite so appealing and so true as that from Stephen Paget,* from which I beg his permission to quote freely:

". . . Sir Victor Horsley's death neither shortens nor lengthens the war by one-half hour. That is true, but we might spend a half-hour to some advantage thinking of him and his work. Why St. Paul calls St. Luke the beloved physician I hardly know. St. Luke's medical knowledge doubtless was such as Browning in the epistle of Karshish attributes to an Arab physician of St. Luke's time. The phrase has become a kindly compliment to any doctor who is gentle and considerate to his patients, charitable in giving his thought and skill even to people who get them for nothing; honorable in the keeping of secrets and attentive to the happiness of the patient's family. There are legions and legions of beloved physicians at that rate. If that were the sum of our loss by Victor Horsley's death we should hardly need, as things are now, to think of him.

"I knew him for thirty years, thirty years of friendship unbroken and on my side unbreakable. There was nobody like him, nobody in his profession so strong in science and practice both together, with such a record of original work in physiology, pathology and surgery, with such passion for im-

* British Weekly.